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(54) Title: DISTRIBUTION OF LOCATION INFORMATION IN IP NETWORKS BY INTELLIGENT ENDPOINTS
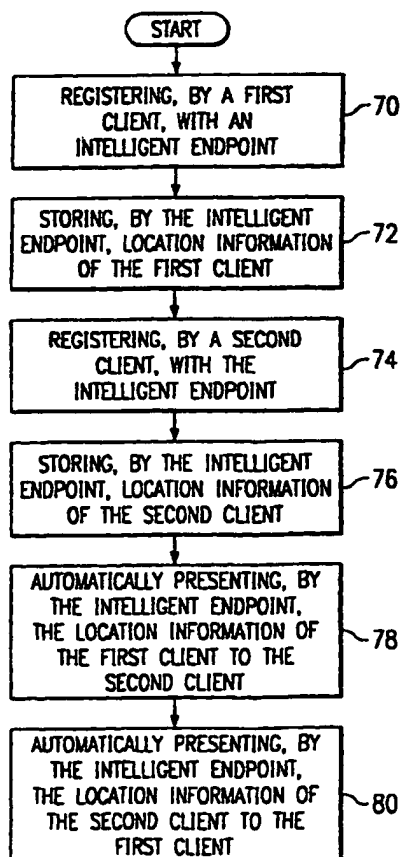
(57) Abstract: A distribution of location information in IP networks by intelligent endpoints is presented. The network comprises an intelligent endpoint operably coupled to a plurality of clients. A first one of the clients registers with the intelligent endpoint that stores location information of the first client. A second one of the clients may also register with the intelligent endpoint that stores the location information of the second client. The intelligent endpoint automatically presents the location information of the first client to the second client and of the second client to the first client. The first client can then directly communicate with the second client. Either client can also be an intelligent endpoint.

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DISTRIBUTION OF LOCATION INFORMATION IN IP NETWORKS BY INTELLIGENT ENDPOINTS

Background

5   This application relates generally to distribution of location information in Internet Protocol (IP) networks and, more particularly, to distribution of location information in IP networks by intelligent endpoints.

With the location information, such as an IP address and/or name
10   of a user, a client (or computer) may communicate with another client in the IP network. Such communication includes data, voice, and multi-media applications.

A conventional method for distributing location information in an IP network has been disclosed by the Internet Engineering Task Force
15   (IETF) standards group with their Session Initiation Protocol (SIP). Fig. 1 depicts an IP network 10 that utilizes the SIP. The network 10 includes a SIP Proxy/Redirect Server 12 that receives and transmits messages between the SIP client's 14 (for example, the caller) and 16 (for example, the callee). The caller 14 and the callee 16 are
20   identified by their respective SIP addresses which are similar to an email address such as caller@host.com. In addition to the caller's 14 name, the caller's 14 telephone number could also be sent as callersnumber@host.com. The domain name ("host") can be a domain name or a numeric network address.

25   Before making a call, both the caller 14 and the callee 16 must Register 18 with the server 12. After registering and receiving an Acknowledge (not shown), the caller 14 can make a SIP call. To do so, the caller (SIP client) 14 sends an Invite 20 to the callee 16 via the server 12. The Invite 20 asks the callee 16 to join in a
30   communication session, such as a Voice over IP (VoIP) call, with the caller 14. The Invite 20 usually contains a session description that contains enough information for the callee 16 to join the communication. For multicast sessions, the session description numbers the types of media and formats that are permitted in the
35   communication session. For unicast sessions, the session description numbers the types of media and formats that the caller 14 is willing to use and to what location the information should be sent. If the callee 16 agrees to join the communication, the caller 14 is alerted

by receiving, from the callee 16, a similar description of the types of media and formats (in the case of a unicast transmission) that the callee 16 is willing to use.   The caller 14 then confirms to the callee 16, via an Acknowledge (or Ack) message 22, that it 14 has

5   received the callee's 16 confirmation.   If the callee 16 wishes to end the communication, a Bye message (not shown) is sent to the caller 14.

There are certain limitations associated with this conventional method of distributing location information.   For example, the caller 14 does not know if the callee 16 is available for the communication

10 session.   As such, network 10 time and capacity are constrained as messages are sent via the server 12 to initiate contact with a callee that may not be available.   Further, the IP address of the callee 16 is not initially known by the caller 14 and thus degrades the network's 10 efficiency because of the messaging required to initiate

15 a communication session.   Additionally, the potential callers and callees do not receive an automatic update when a new client is available or unavailable for contact.   Also, ownership, capacity, and privacy issues exist.   The ownership issue deals with the responsibility for ensuring that the server 12 is functioning

20 properly.   If the server 12 goes "down," the users may not know the reason for the downed server or who to contact to get an update.   The capacity issue deals with the fact that existing servers are free and thus often overloaded making communication difficult.   The privacy issue deals with the fact that all users may "see" all other

25 registered users and that the owner (or operator) of the server 12 can track users calls because they are being transported via the server 12.

In order to make an IP based call, the IP address of the called party must be known or determined before the call can be made.   Today,

30 users which dial into Internet Service Providers are allocated a different IP address each time they log in.   Therefore, a method and network (such as an IP network) for distribution of location information, where a user (or username) is mapped to an IP address, that reduces or eliminates these limitations and inefficiencies is

35 desired.

Summary

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In response to these and other limitations, provided herein is a unique system and method for distributing location information in IP networks by intelligent endpoints.

The system (or IP network) of the present invention comprises an intelligent endpoint operably coupled to a plurality of clients. In one embodiment, a first one of the clients registers with the intelligent endpoint that stores location information of the first client. A second one of the clients may also register with the intelligent endpoint that stores the location information of the second client. The intelligent endpoint automatically presents the location information of the first client to the second client and of the second client to the first client.

In some embodiments the first client directly communicates with the second client.

In some embodiments the location information comprises the clients IP address.

In some embodiments the location information comprises a user's name, wherein the user is associated with one of the clients.

In some embodiments the intelligent endpoint comprises a static IP address.

In some embodiments the intelligent endpoint is associated with an area of interest.

In some embodiments the intelligent endpoint is associated with a plurality of areas of interest.

In some embodiments the intelligent endpoint registers with a second intelligent endpoint, where the second intelligent endpoint is associated with a second area of interest.

In some embodiments a plurality of clients register with a plurality of endpoints, where the registration includes each client's (or user's) areas of interest.

In some embodiments a private group of clients registers with the intelligent endpoint.

In some embodiments the first client de-registers with the intelligent endpoint which deletes the location information of the first client and automatically removes the location information of the first client with the second client.

These advantages, as well as others which will become apparent, are described in greater detail with respect to the drawings and the following disclosure.

5   **Brief Description of the Drawings**

Fig. 1 is a diagrammatic view of a prior art communication system for distributing location information.

Fig.2 is a diagrammatic view of a communication system of the present invention for distributing location information.

10   Fig. 3 is a computer of the present invention.

Fig. 4 is a flow chart of a method for distributing location information in an Internet Protocol network of the present invention.

Detailed Description

Fig. 2 depicts an Internet Protocol (IP) network 28 of the

15   present invention. The network 28 includes an intelligent endpoint (or super client) 30 that is operably coupled to a plurality of clients 32-38. The intelligent endpoint 30, which may be SIP based (i.e. an extension of SIP) comprises a static IP address and includes an always available IP connection (via, for example, a cable modem or

20   Digital Subscriber Line). The user of the intelligent endpoint 30 provides its IP address to the plurality of clients 32-38. If client 32 (Joe) decides to go on-line, he registers, via a Register message 40 with the intelligent endpoint 30 that stores the location information of the client 32. The Register message 40 includes the

25   location information (such as an IP address or user's name - where the user is associated with one of the clients) of the client 32. After the client 32 has registered, it 32 receives a message from the intelligent endpoint 30 indicating that it is the only client registered thus far. As such, Joe may want to initiate a

30   communication with Mary.

If client 34 (Pat) then registers, its 34 location information is stored with the intelligent endpoint 30. The intelligent endpoint 30 then automatically sends a message to the client 34 indicating (or presenting) to Pat that Joe is also on-line and provides the client's

35   32 location information. Similarly, the intelligent endpoint 30 automatically sends a message to the client 32 indicating to Joe that Pat is on-line and provides the client's 34 location information.

The clients location information may be presented via a "pop-up" window, such as a Graphical User Interface, that can be accessed (for example, "double clicked") to initiate a communication session. The communication may be, for example, a VoIP call, a multi-media

5 conference, or a "text chat" call. Either client 32, 34 may now directly communicate with the other (or with the intelligent endpoint 30).

As each additional client 36, 38 registers with the intelligent endpoint 30, they 36, 38, as well as the clients 32, 34, are updated

10 with each others location information and thus their users (Joe, Pat, Fred, and Bob) can easily communicate with one another. As such, after the clients have registered with the intelligent endpoint 30, no messaging must traverse the intelligent endpoint 30 for communication between the clients.

15 If a client wishes to go off-line (or de-register) a Register message, with a time out value of zero (not shown), is sent to the intelligent endpoint 30. The intelligent endpoint 30 deletes the location information of the client and automatically removes that information from the remaining clients'

20 pop-up window (for example) that are still on-line. Thus, the remaining clients are immediately updated of this fact and know to not attempt a communication with the departed client.

Intelligent endpoints of the present invention are associated with an area of interest (or group). For example, the intelligent

25 endpoint 30 may be associated with the "Dallas Cowboys" area of interest. The users are probably interested in communicating with other Dallas Cowboy fans and thus register with the intelligent endpoint 30. The intelligent endpoint 30 may also be associated with many areas of interest (or groups) and may register (by sending its IP

30 address) with another intelligent endpoint 50 that is associated with another area of interest, such as "High-Tech Stocks." The clients 52, 54 of the intelligent endpoint 50 may communicate with one another in a similar manner as described above. Additionally, the clients 52, 54 may register with the intelligent endpoint 30 and communicate with

35 clients 32-38. As such, Julie may communicate directly with Bob.

In addition to including a client's location information, each registration message may also include a client's (or user's) areas of

interest. As such, if an intelligent endpoint registers with another
intelligent endpoint that includes an area of interest specified by a
user, that user's client will be alerted to that fact allowing the
user to communicate with other users who have the same interest.

5   Additionally, users may set up private groups by only allowing pre-
defined users' clients to register with an intelligent endpoint.

        Any of the clients 32-38, 52, 54 may become intelligent endpoints
if they can provide a static IP address and an always available IP
connection. As such, Pat may decide to start a new group and could

10   alert others that his client 34 is now an intelligent endpoint for a
new area of interest. Those clients who are interested in the new
area, may register with Pat's client 34 and communicate with one
another in a similar manner as described above. As this communication
is occurring, Pat may simultaneously communicate with other clients

15   and/or other intelligent endpoints.

        Fig. 3 depicts a computer 60 (which contains a computer program)
that comprises a processor 62 and memory 64. The computer 60 may be a
personal computer or laptop, the clients 32-38, 52-54, the intelligent
endpoints 30, 50, and/or any device that can send and receive IP

20   information. The processor 62 may be a central processing unit,
digital signal processor, microprocessor, microcontroller,
microcomputer, and/or any device that manipulates digital information
based on programming instructions. The memory 64 may be read-only
memory, random access memory, flash memory and/or any device that

25   stores digital information. The memory 64 is coupled to the processor
62 and stores programming instructions (the computer program) that,
when read by the processor 62, cause the processor to perform certain
processing operations.

        Fig. 4 depicts a method for distributing location information in

30   an IP network that may be implemented by the computers described
above. The method begins at step 70 where a first client registers
with an intelligent endpoint that stores, at step 72, location
information of the first client. At step 74, a second client
registers with the intelligent endpoint that stores, at step 76,

35   location information of the second client. The method proceeds to
step 78 where the intelligent endpoint automatically presents the
location information of the first client to the second client and, at

step 80, automatically presents the location information of the second client to the first client

The present invention thus enjoys several advantages. For example, an intelligent endpoint is described that efficiently and

5   effectively distributes location information, which includes a client's IP address and/or a user name, across an IP network. Additionally, a user may specify, to the intelligent endpoint, the groups or area's he/she is interested in. Also, the ownership, capacity and privacy issues of the prior art are addressed because the

10 intelligent endpoint contact is known to the users, the size of the groups are generally small, and the users only "see" other registered users in the same intelligent endpoint and/or in another intelligent endpoint registered with the same intelligent endpoint. Further, the improvements of the present invention may be applied to and used with

15 the SIP, SIP Proxy/Redirect Server, and the SIP clients.

It is understood that variations may be made in the foregoing without departing from the scope of the present invention. For example, any number and combination of entities such the clients 32-38, 52-54, the intelligent endpoints 30, 50, and the computer 60, may

20 comprise or be used with the present network 28. Also, the network 28 may be connected to another wireless, wireline, data, voice, and/or multi-media network. Further, other parameters may be included in the Register message 40 that provides the intelligent endpoint 30 with additional information. For example, a parameter may inform the

25 intelligent endpoint 30 that a client is an intelligent endpoint enabled client and thus has certain privileges and rights.

It is further understood that other modifications, changes and substitutions are intended in the foregoing disclosure and in some instances some features of the disclosure will be employed without

30 corresponding use of other features. Additionally, singular discussion of items and/or computers located in the network 28 is also meant to apply to situations where a plurality of items and/or computers exist. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the scope

35 of the disclosure.

WHAT IS CLAIMED IS:

1.   A method for distributing location information in an Internet Protocol (IP) network that comprises an intelligent endpoint operably coupled to clients, the method comprising:

5   registering, by a first one of the clients, with the intelligent endpoint;

        storing, by the intelligent endpoint, the location information of the first client;

        registering, by a second one of the clients, with the intelligent

10 endpoint;

        storing, by the intelligent endpoint, the location information of the second client;

        automatically presenting, by the intelligent endpoint, the location information of the first client to the second client; and

15   automatically presenting, by the intelligent endpoint, the location information of the second client to the first client.

2.   The method of claim 1 further comprising directly communicating, by the first client, with the second client.

20

3.   The method of claim 1, wherein the location information comprises the clients IP address.

4.   The method of claim 1, wherein the location information comprises

25 a user's name, wherein the user is associated with one of the clients.

5.   The method of claim 1, wherein the intelligent endpoint comprises a static IP address.

30 6.   The method of claim 1, wherein the intelligent endpoint is associated with an area of interest.

7.   The method of claim 1, wherein the intelligent endpoint is associated with a plurality of areas of interest.

35 8.   The method of claim 1 further comprising registering by the intelligent endpoint with a second intelligent endpoint, wherein the

second intelligent endpoint is associated with a second area of interest.

9.   The method of claim 1 further comprising registering, by a plurality of clients, with a plurality of intelligent endpoints, wherein the registration includes each client's areas of interest.

10. The method of claim 1 further comprising registering, by a private group of clients, with the intelligent endpoint.

11. The method of claim 1 further comprising:
de-registering, by the first client, with the intelligent endpoint;
deleting, by the intelligent endpoint, the location information of the first client; and
automatically removing, by the intelligent endpoint, the location information of the first client with the second client.

12. A system for distributing location information in an Internet Protocol (IP) network that comprises an intelligent endpoint operably coupled to clients, the system comprises:
means for registering, by a first one of the clients, with the intelligent endpoint;
means for storing, by the intelligent endpoint, the location information of the first client;
means for registering, by a second one of the clients, with the intelligent endpoint;
means for storing, by the intelligent endpoint, the location information of the second client;
means for automatically presenting, by the intelligent endpoint, the location information of the first client to the second client; and
means for automatically presenting, by the intelligent endpoint, the location information of the second client to the first client.

13. The system of claim 1 further comprises means for directly communicating, by the first client, with the second client.

14.   The system of claim 1, wherein the location information comprises the clients IP address.

15.   The system of claim 1, wherein the location information comprises a user's name, wherein the user is associated with one of the clients.

16.   The system of claim 1, wherein the intelligent endpoint comprises a static IP address.

17.   The system of claim 1, wherein the intelligent endpoint is associated with an area of interest.

18.   The system of claim 1, wherein the intelligent endpoint is associated with a plurality of areas of interest.

19.   The system of claim 1 further comprises means for registering by the intelligent endpoint with a second intelligent endpoint, wherein the second intelligent endpoint is associated with a second area of interest.

20.   The system of claim 1 further comprises means for registering, by a plurality of clients, with a plurality of endpoints, wherein the registration includes each client's areas of interest.

21.   The system of claim 1 further comprises means for registering, by a private group of clients, with the intelligent endpoint.

22.   The system of claim 1 further comprises:
        means for de-registering, by the first client, with the intelligent endpoint;
        means for deleting, by the intelligent endpoint, the location information of the first client; and
        means for automatically removing, by the intelligent endpoint, the location information of the first client with the second client.

23.   An intelligent endpoint for distributing location information in an Internet Protocol (IP) network, wherein the IP network includes

clients operably coupled to the intelligent endpoint, the intelligent endpoint comprises:

 means for registering a first one of the clients;

 means for storing the location information of the first client;

5 means for registering a second one of the clients;

 means for storing the location information of the second client;

 means for automatically presenting the location information of the first client to the second client; and

 means for automatically presenting the location information of

10 the second client to the first client.

24. An Internet Protocol (IP) network comprises:

 an intelligent endpoint;

 clients operably coupled to the intelligent endpoint, wherein the

15 intelligent endpoint performs at least one of the following steps from a group consisting of:

 registering a first one of the clients;

 storing location information of the first client;

 registering a second one of the clients;

20 storing location information of the second client;

 automatically presenting the location information of the first client to the second client; and

 automatically presenting the location information of the second client to the first client.

25

25. A computer program comprising instructions for:

 registering, by a first client, with an intelligent endpoint, wherein the first client is operably coupled to the intelligent endpoint;

30 storing, by the intelligent endpoint, location information of the first client;

 registering, by a second one of the clients, with the intelligent endpoint wherein the second client is operably coupled to the intelligent endpoint;

35 storing, by the intelligent endpoint, location information of the second client;

automatically presenting, by the intelligent endpoint, the
location information of the first client to the second client; and
automatically presenting, by the intelligent endpoint, the
location information of the second client to the first client.

5

26.   The computer program of claim 25 further comprising instructions
for directly communicating, by the first client, with the second
client.

10   27.   The computer program of claim 25, wherein the location
information comprises the clients IP address.

28.   The computer program of claim 25, wherein the location
information comprises a user's name, wherein the user is associated

15   with one of the clients.

29.   The computer program of claim 25, wherein the intelligent
endpoint comprises a static IP address.

20   30.   The computer program of claim 25, wherein the intelligent
endpoint is associated with an area of interest.

31.   The computer program of claim 25, wherein the intelligent
endpoint is associated with a plurality of areas of interest.

25

32.   The computer program of claim 25 further comprising instructions
for registering by the intelligent endpoint with a second intelligent
endpoint, wherein the second intelligent endpoint is associated with a
second area of interest.

30

33.   The computer program of claim 25 further comprising instructions
for registering, by a plurality of clients, with a plurality of
endpoints.

35   34.   The computer program of claim 25 further comprising instructions
for registering, by a private group of clients, with the intelligent
endpoint.

12

35.   The computer program of claim 25 further comprising instructions
for:

     de-registering, by the first client, with the intelligent

5   endpoint;

     deleting, by the intelligent endpoint, the location information
of the first client; and

     automatically removing, by the intelligent endpoint, the location
information of the first client with the second client.

10

Fig. 1
(PRIOR ART)

Fig. 3

START

REGISTERING, BY A FIRST CLIENT, WITH AN INTELLIGENT ENDPOINT — 70

STORING, BY THE INTELLIGENT ENDPOINT, LOCATION INFORMATION OF THE FIRST CLIENT — 72

REGISTERING, BY A SECOND CLIENT, WITH THE INTELLIGENT ENDPOINT — 74

STORING, BY THE INTELLIGENT ENDPOINT, LOCATION INFORMATION OF THE SECOND CLIENT — 76

AUTOMATICALLY PRESENTING, BY THE INTELLIGENT ENDPOINT, THE LOCATION INFORMATION OF THE FIRST CLIENT TO THE SECOND CLIENT — 78

AUTOMATICALLY PRESENTING, BY THE INTELLIGENT ENDPOINT, THE LOCATION INFORMATION OF THE SECOND CLIENT TO THE FIRST CLIENT — 80

Fig. 4
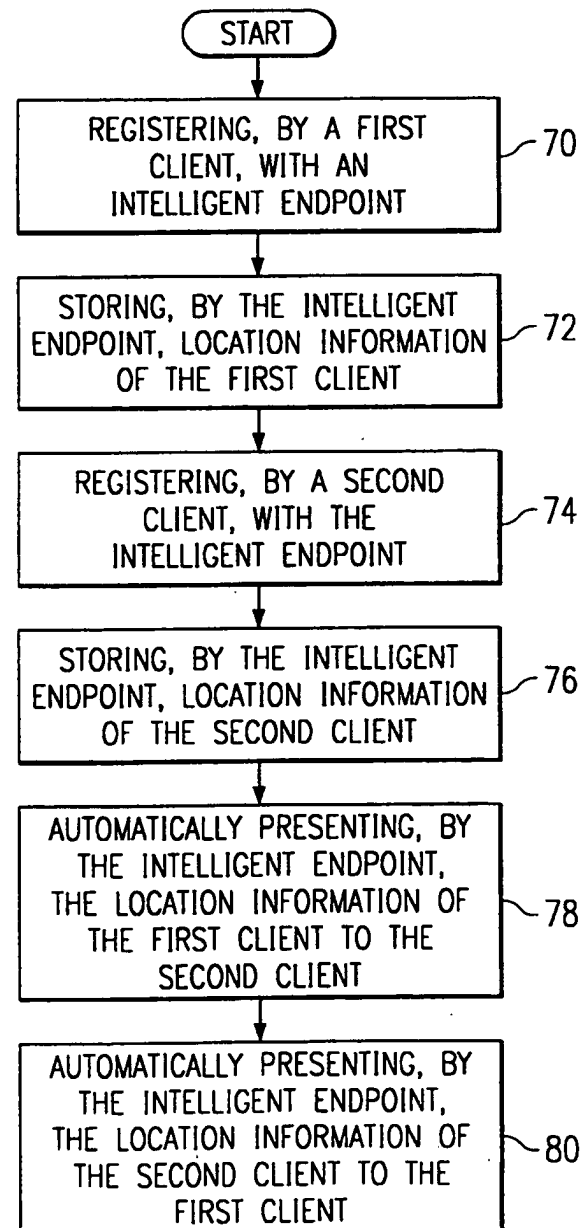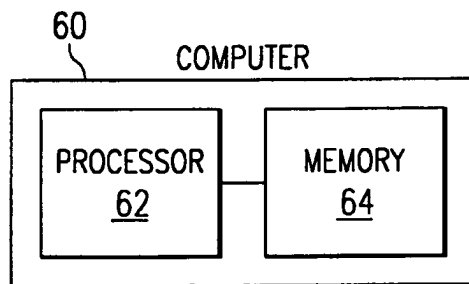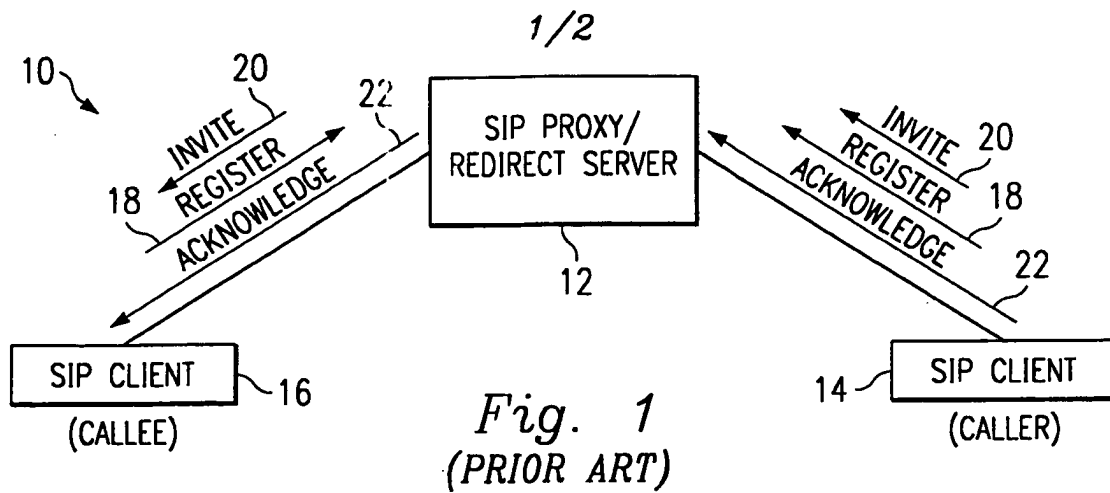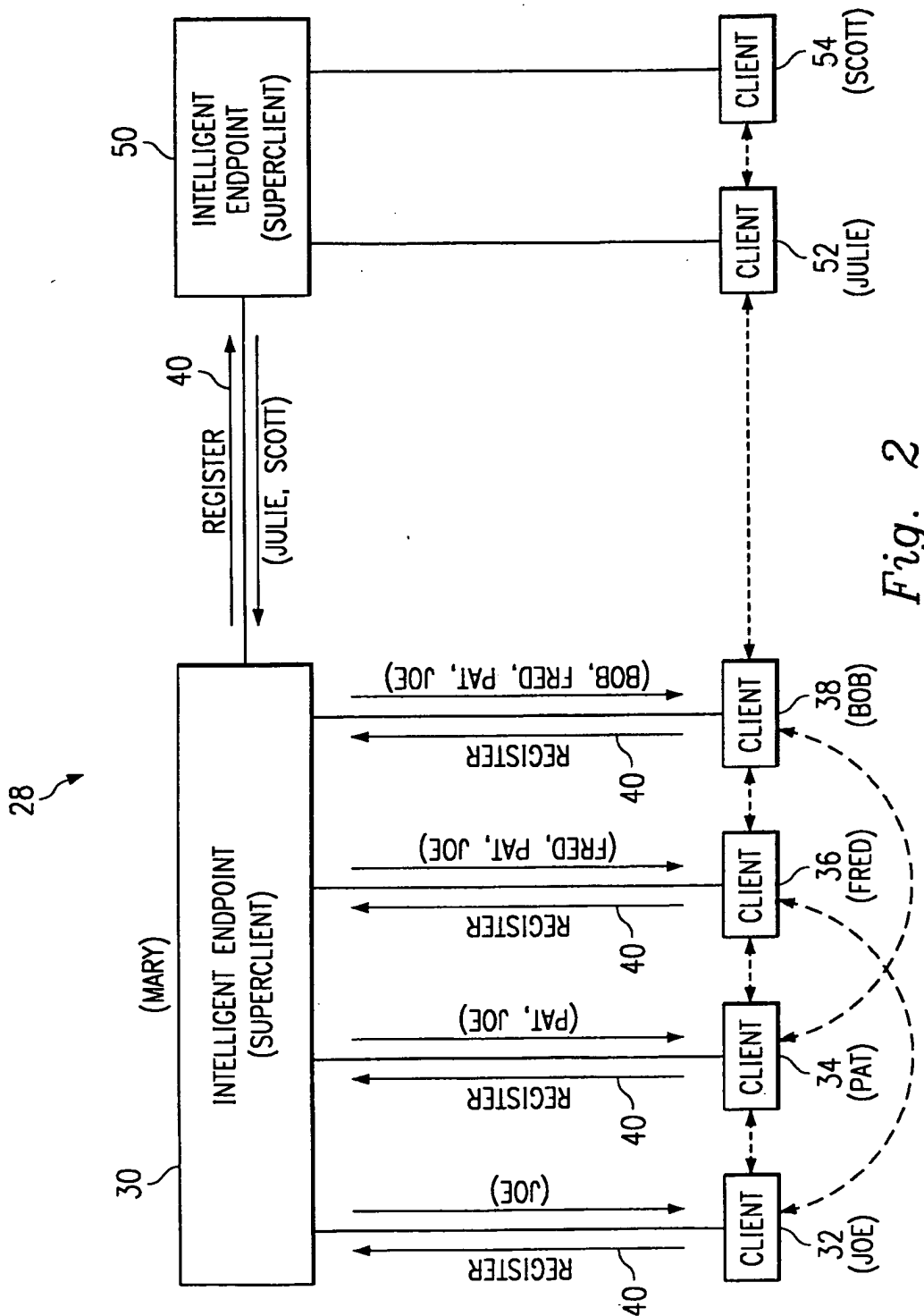
Fig. 2

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H04L29/06   H04L29/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7   H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 16045 A (MIRABILIS LTD ;VARDI ARIEH (IL); AMNON AMIR (IL); GOLDFINGER YAIR) 16 April 1998 (1998-04-16)	1-5, 10-16, 21-29, 33-35
Y	abstract; claim 1; figure 1	6-9, 17-20, 30-32
	page 2, line 15 - line 34 page 3, line 11 - line 28 page 7, line 26 -page 8, line 14 page 9, line 27 - line 30 page 10, line 16 - line 25 page 11, line 22 - line 29 --- -/--	

[X] Further documents are listed in the continuation of box C.   [X] Patent family members are listed in annex.

° Special categories of cited documents :

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

'&' document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 May 2001	21/05/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Stergiou, C

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	MULLER N: "DIAL 1-800-INTERNET WITH NEW SOFTWARE, YOU CAN TALK BUSINESS OVER THE NET AND AVOID LONG-DISTANCE CHARGES" BYTE,US,MCGRAW-HILL INC. ST PETERBOROUGH, vol. 21, no. 2, 1 February 1996 (1996-02-01), pages 83-84,86,88, XP000566097 ISSN: 0360-5280 page 83, column 1, line 1, paragraph 1 -page 84, column 3, paragraph 3; figure 1	6-9, 17-20, 30-32
A	TOGA J ET AL: "ITU-T STANDARDIZATION ACTIVITIES FOR INTERACTIVE MULTIMEDIA COMMUNICATIONS ON PACKET-BASED NETWORKS: H.323 AND RELATED RECOMMENDATIONS" COMPUTER NETWORKS AND ISDN SYSTEMS,NORTH HOLLAND PUBLISHING. AMSTERDAM,NL, vol. 31, no. 3, 11 February 1999 (1999-02-11), pages 205-223, XP000700319 ISSN: 0169-7552 page 210, column 1, paragraph 3.4 -page 211, column 1, paragraph 4	1-35

4

INTERNATIONAL SEARCH REPORT

Information on patent family members

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
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		BR	9712207 A	25-01-2000
		CN	1240083 A	29-12-1999
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